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Purpose/Objective: Radiation therapy (RT) after radical prostatectomy (RP) improves prognosis in patients with high risk prostate cancer. However 5-year biochemical recurrence-free survival (bRFS) is only 75-80%. An advantage of hypofractionation is to reduce RT duration and to improve the probability of cure. However hypofractionation is potentially associated with an increased incidence of late toxicity, especially after RP. Data on efficacy and tolerability of hypofractionated RT in the postoperative setting are still lacking. Therefore, aim of this study is to compare two different trials using postoperative RT with conventional fractionation versus hypofractionation.

Materials and Methods: In an observational study, postoperative RT was performed with three dimensional conformal radiotherapy (3DCRT) (Total dose: 70.2 Gy/1.8 Gy per fraction). In a fase I-II trial, postoperative RT was performed with intensity modulated radiotherapy (IMRT) using simultaneous integrated boost (SIB) technique (Total dose 62.5 Gy/2.5 Gy per fraction). In both trials, prophylactic nodal irradiation and/or adjuvant hormonotherapy were administered according to risk factors. bRFS (PSA < 0.2 ng/ml), local control, disease-free-survival (DFS) and overall survival (OS) were analyzed using Kaplan-Meier method. A comparison of the survival curves was performed using long rank test (univariate analysis) or Cox Proportional Hazards Method (multivariate analysis; covariates: risk group, nodal irradiation and hormonotherapy duration).

Results: Considering the two studies, 194 patients were enrolled. Three-year bRFS was 83.3% (pN0: 90.3% vs pN1: 62.5%). The results are shown in Table 1. In terms of bRFS there was no statistical difference between the two series, even at multivariate analisys (p= 0.689).

		Observational study 3D-CRT	fase I-II trial IMRT-SIB	p:
Number of patients		67	127	
Dose/fraction (Gy)		70.2/1.8	62.5 /2.5	
Risk groups according to NCCN-2014	low	1.5 %	0.8 %	
	intermediate	14.9 %	16.5 %	0.866
	high	83.6 %	82.7 %	
N1		20.6 %	6.8 %	**0.008**
R1		86.6 %	84.3 %	0.667
Acute toxicity	GI > G2 *	4.5 %	0.0 %	**0.019**
	GU > G2 *	1.5 %	0.8 %	0.665
Late toxicity free survival	GI > G1 §	83.9 %	97.7 %	**0.002**
	GU > G1 §	74.5 %	87.6 %	0.258
bRFS	(5 years)	85.2 %	80.1 %	0.689

*: RTOG scale ; §: RTOG-EORTC scale (% at 2 years); GI gastrointestinal; GU genitourinary;

Conclusions: High dose adjuvant RT modulated based on risk factors (+/- prophylactic nodal irradiation, +/- adjuvant hormonotherapy) produced a better biochemical control compared to standard postoperative RT. Patients treated with IMRT-SIB technique showed a lower rate of acute and late gastrointestinal toxicity.

PO-0739

Plasma citrulline is a potential biomarker for small bowel toxicity following radiotherapy for prostate cancer

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Purpose/Objective: Small bowel toxicity from external beam radiotherapy (EBRT) for prostate cancer is poorly predicted from current DVH based models. The dose absorbed by this mobile organ throughout a fractionated course of EBRT cannot easily be calculated from a single planning CT scan. Plasma levels of citrulline (an amino acid, secreted by the gut) is a putative biomarker of small bowel radiation induced damage and as such a decrease in levels may predict small bowel toxicity. In this prospective, clinical study, we explored the relationship between the change in plasma citrulline in relation to both gastrointestinal toxicity and small bowel dosimetry in patients receiving radical EBRT for prostate cancer.

Materials and Methods: We recruited 15 patients treated with EBRT to either prostate only (n=6) or prostate and pelvis (n=9). Plasma citrulline levels were measured prior to radiotherapy and weekly during treatment and at 6 weeks, 3 months and 6 months post EBRT. Bowel toxicity was assessed at the same time points using EPIC bowel summary scores. Small bowel dosimetry was calculated on a single pre-treatment radiotherapy planning scan.

Results: The strongest correlation between the fall in plasma citrulline levels from baseline and greatest bowel toxicity was observed after 3 weeks of radiotherapy (two tailed Spearman's rank test p=0.03). We further explored the ability of this week 3 plasma citrulline decrease to predict bowel toxicity up to one year post radiotherapy with two-tailed Spearman rank tests between radiotherapy week 3 citrulline change and EPIC bowel toxicity change. A strong predictive trend was noted with positive correlations at 6 weeks post radiotherapy (correlation co-efficient =0.594, p=0.025), 3 months post radiotherapy (correlation co-efficient =0.534, p=0.060), 6 months post radiotherapy (correlation co-efficient =0.606, p=0.037), 9 months post radiotherapy (correlation co-efficient =0.618, p=0.019) and 1 year post radiotherapy (correlation co-efficient =0.358, p=0.345). No significant correlation was found between changes in plasma citrulline levels or EPIC reported toxicity and the small bowel V15, dose to 1cm^3, dose to 17cm^3 or max point dose.

Conclusions: Decreases in plasma citrulline after 3 weeks of pelvic EBRT may have the potential to predict small bowel toxicity in prostate cancer patients receiving radical external beam radiotherapy. Further study in a larger cohort is warranted.

PO-0740

An image-guided SBRT phase II study with a dose of 42 Gy in 7 fractions for the localized prostate cancer

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